NEWPORT MkII DELUXE INSTALLATION & OWNER'S MANUAL

Installation, Operation, Maintenance

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06-11

Thank you for purchasing a Spectra Newport system. Properly installed it will provide years of trouble free service. Please pay attention to the installation instructions and the system layout. Like any piece of mechanical equipment the system will require inspection and service from time to time. Do not place the components in inaccessible areas that will prevent proper maintenance. If you are having a dealer install the system for you, review the location of the components to make sure that the installation will meet your approval upon completion.

Newport Installation Quick Start

Important Details for Installer

1. The system must have a dedicated sea water inlet to guarantee a solid flow of water to the system. The inlet should be as low in the boat as possible and with a scoop type forward facing thru-hull fitting installed.

2. Both the Newport MkII Feed pump module and the Clark pump/Membrane module must be installed in a well ventilated compartment where **temperatures will not exceed 120F (48C).** Many engine compartments exceed this temperature when underway. Warranty will be void if the installation does not meet this requirement.

3. Follow the wire gauge charts in the instructions! Using larger wire than specified is acceptable.

4. If you are separating the Clark pump/membrane assembly, please review the high pressure tube assembly instructions. Improper assembly will cause failure!

5. Run, test, then "sea trial" the complete system before assuming the system is operational. If the boat is in fresh or dirty water, see "Dry testing the system." After testing make sure that the flush cycle operates properly. The water going overboard at the end of the flush should not taste salty (<1000ppm)

6. If installing the optional Fresh Water Flush module the domestic fresh water pressure must be on and the fresh water tank level maintained for the system to operate properly.

7. Spectra dealers are responsible for educating the vessel owners on the operation and maintenance of the system. We request that you "walk through" the installation with our customer.

8. Please have the owner fill out the warranty card. The warranty is void if it is not registered.

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Getting Started

Unpack the system and inspect it to make sure that it has not been damaged in shipment.

Refer to the shipping list for your system to make sure you have received all of the components listed. Do not discard any packaging until you have found and identified all of the parts. The small installation parts are listed on the cellophane bags' pick list.

We will not be held responsible for shortages and/or freight damage that are not reported within thirty days of the ship date.

Next, study the system layout diagram, component photos and descriptions before beginning your installation. This will assist you in understanding the function of each component.

Layout the system. Before starting the installation identify the location where each module and component will be placed. Ensure that there is proper clearance around the components for removing the filters and system service. Also check to make sure you have adequate tubing and hose before starting so additional parts may be ordered.

Newport MkII Deluxe shipping list:

- Newport Deluxe Feed Pump Module
- High Pressure Clark Pump and Reverse Osmosis Membrane Module
- Newport Mk II Deluxe Installation Kit
- Boost Pump Module
- Newport Service Kit
- 1/2" Black Nylon tube (10')
- 5/8" Hose (25')
- 3/4" Suction Hose (25')
- 1/4" Black Nylon Tube (25')
- *Optional MkII Fresh Water Flush Module*
- *Optional Remote Control*
- *Optional Feed Water Pressure Gauge*

Installation Basics

- **Read the directions!**
- Avoid tight hose bends and excessive runs.
- Use heavy gauge wire.
- Install feed pump as low as possible.
- Use a dedicated thru-hull with scoop type strainer.

Thru-hulls

It is mandatory that a dedicated 3/4" to 1" forward facing, scoop -type, intake thru -hull and seacock be installed. Install the intake for the system close to the middle, and as far below the water line as possible. Thru-hulls in the bow area are susceptible to air intake in rough conditions. Sharing a thru -hull with another system is not acceptable and will void the warranty. Sharing a thru -hull can introduce unforeseen problems such as intermittent flow restriction, air bubbles, and contaminates. For racing boats and high speed power boats above 15 knots, a retractable, snorkel -type, thru -hull fitting is preferred to be able to pick up water away from the hull.

Do not install the intake close to or downstream of a head discharge. Install as far below the waterline, and as close to center line as possible to avoid contamination and air induction.

The brine discharge through -hull should be mounted above the waterline, in, or just above the boot stripe to minimize water lift.

Double clamp all hose connections below the waterline.

Pipe Fitting Instruction

Plastic to plastic fittings should have 3 to 4 wraps of Teflon tape and will thread almost all the way in.

Avoid getting dirt or debris into the piping or hoses during assembly. A small bit of debris can stop the system! Avoid getting Teflon tape over the end of fittings that might get into the system. To insure this does not happen, leave the very first thread uncoated.

Avoid restrictions or long runs on the entire inlet side of the plumbing from the thru hull to the main feed pump module.

Prevent tight bends and excessive elbows. Any restrictions will hamper system performance. Secure the piping away from moving objects such as engine belts and hatches. Prevent chafe on the tubing as required. Test and inspect all piping and hose clamps after several hours of operation.

Wiring

- **Pay attention to wire size or system performance will be impaired.**
- Perform wiring to UL, ABYC, CE or applicable standards.

Component Placement

Refer to the Plumbing Diagrams

Strainer

Mount the strainer in an accessible area close to the intake through - hull that can handle water spillage during service. Extra care during assembly must be taken to avoid air leaks from the strainer. Use the supplied "Quick Block" and wire tie for mounting.

Optional Fresh Water Flush Module

The fresh water flush module may be located in any convenient location near the Feed pump module. It should be mounted with the filter housing vertical and accessible for changing filters. Allow 2" below the filter housing for removal. Do not install over electrical equipment. The unit contains a charcoal filter for the flush water, ball valve, and flush water pressure regulator.

Boost Pump module

The boost pump module should be mounted vertically with the service hose connection at the top. The boost pump **MUST BE INSTALLED BELOW THE WATERLINE** to ensure that it will prime.

Feed Pump Module

Mount the feed pump module upright on a horizontal or vertical surface that can be up to 3' (1.0M) above the waterline. It is <u>preferable</u> to mount as low as possible. Locate in an area that allows easy access to the filters and left hand side and where water spills during filter changes will not be a problem. Keep future maintenance in mind when choosing a location. The feed pump has overheat protection and will not operate properly at ambient temperatures over 120F (48C).

Remove front cover to access mounting holes in the enclosure.

Clark Pump/Membrane Module

The membrane maximum temperature specification is 120F (50C). This module must be installed in an area that maintains a temperature below 120F (50C). A cool location is preferable. It may be placed as high in the boat as you desire. Make sure that the area around and under the pump does not have any water sensitive equipment. Water will be spilled during any repairs or if a leak occurs.

Install the module where you will have access to the pressure relief valve on the Clark pump.

The Clark pump/membrane module comes complete with a mounting system. Be sure to use the supplied washers on the rubber feet. Use it as a template for drilling the mount holes. You may mount the Clark Pump in any position, even upside down.

Note: If your machine is equipped with the optional Z-brane, see the Z-brane Installation and Operation section of this manual for instructions on installing the Z-brane anodes into the membrane end plugs. **This should be done before installing the Clark Pump/Membrane Module.**

Membrane Pressure Vessel Mounting

The Clark pump and membrane assembly has been pre -assembled at the factory. If it is necessary to disassemble this module and mount the pressure vessel remotely use guidelines in the back of this manual. Use only approved tubing for assembly.

Optional Remote Control Panel

The remote control panel can be mounted anywhere that is convenient. Cut a 4 -1/4" (11cm) wide by 4-5/8" (12cm) high opening for the panel. Locate it in a protected area where it will be easy to read the gauges and operate the buttons.

The panel will have both fresh and salt water tubing connections and an electrical cable. Install in a location that leaks will not cause permanent irreparable damage.

Detailed installation instructions are supplied with the Remote Gauge Panel

Plumbing

From the inlet thru hull to the boost pump module and from the boost pump module to the feed pump module inlet use supplied clear 3/4" (19mm) spiral wrapped suction hose.

The outlet of the feed pump on the main module to the Clark pump assembly is under pressure, use the supplied black Nylon tube for a Newport 400 Deluxe, or the 3/4" Gray PVC hose for Newport 700 and 1000 Deluxe.

From the Clark pump brine discharge quick connect to the discharge thru -hull use the supplied 5/8" (15.9mm) clear braided vinyl hose.

Use two grab rings on the 1/2 parker tubing. Refer to the parker assembly instructions.

Route all hoses and tubes to prevent kinks and restrictions. Secure piping away from moving objects such as engine belts and hatches. Prevent chafe on tubing as required. Test and inspect all piping and hose clamps after several hours of operation.

System Piping schematic

From the Clark pump brine discharge connector use the supplied 5/8 (15.9mm) clear braided vinyl hose to the brine overboard fitting.

Optional

Mount the pressure gauge in the low pressure inlet gauge tee.

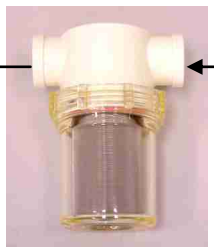
Newport 400 Deluxe
Use the 1/2 inch nylon tubing between the pump module Outlet and the Clark Pump

Newport 700/1000 Deluxe
Use the 3/4 inch gray PVC hose between the pump module Outlet and the Clark Pump

Optional

Flush water from ship's pressure water system 25 psi (2bar) minimum

From the Boost Pump to the 20 micron filter inlet us the 3/4" (19mm)spiral wrapped suction hose.



From the inlet thru hull to the boost pump module use the supplied clear 3/4" (19mm) spiral wrapped suction hose.

Note! When plumbing the Newport Pump Module route the feed water so that the front cover may be opened without removing the hose or tubing.

Leave room on this side for the feed pump outlet connection.

Feed water inlet from boost pump. Leave enough extra length in this hose to allow the front cover to be moved aside.

Feed Pump Inlet from 5 Micron Filter

Feed Pump Outlet to Clark Pump

Product Water tubing

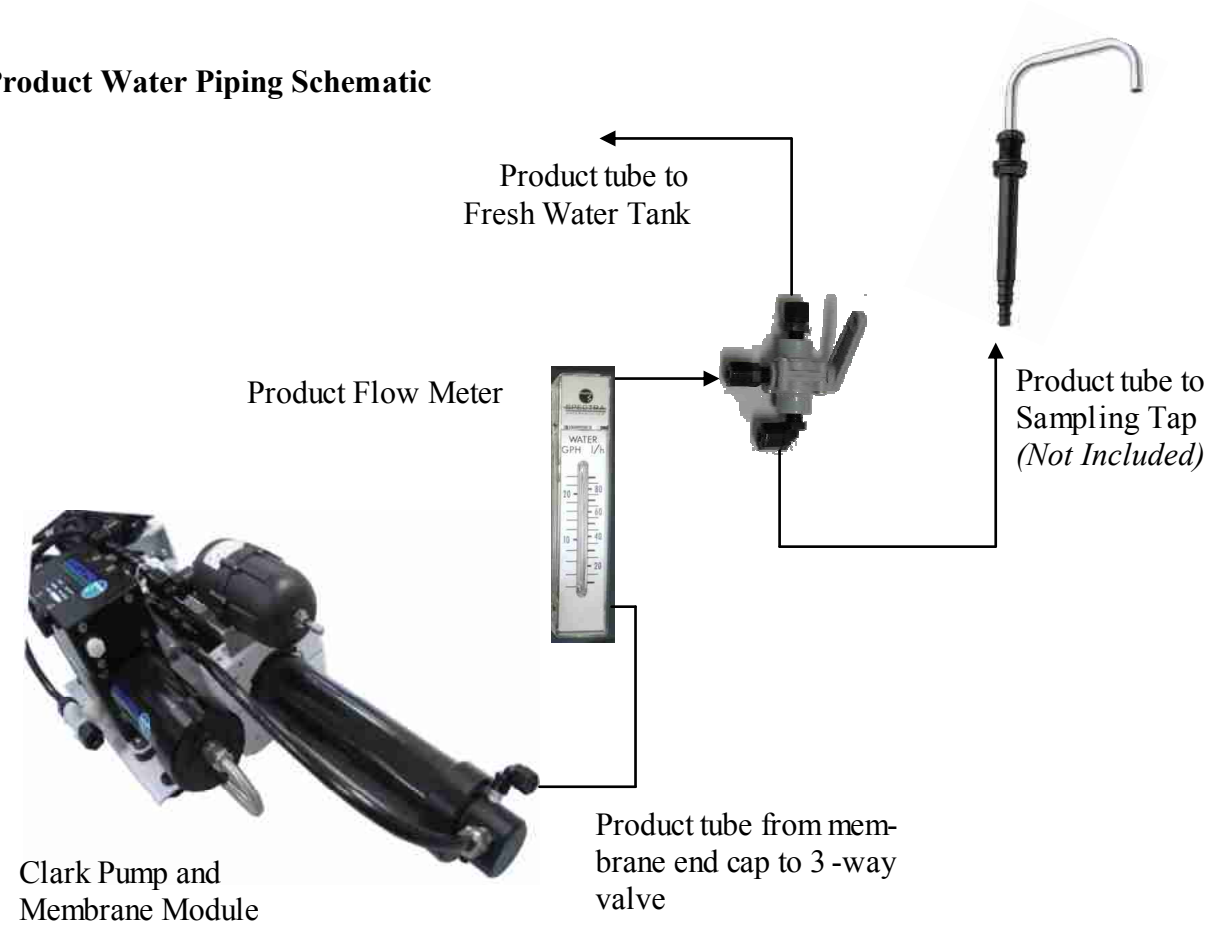
Product water tubing is 1/4 " (6.3mm) parker tubing. ***See the Parker tube fitting assembly diagram next page***. Product water goes from the membrane into the center port on the supplied 3 -way valve.

One side of the 3-way valve should be connected to a sampling tap (not included) and the remaining port will be connected to the Fresh Water Supply tanks. **Mount the 3-way in an accessible location.**

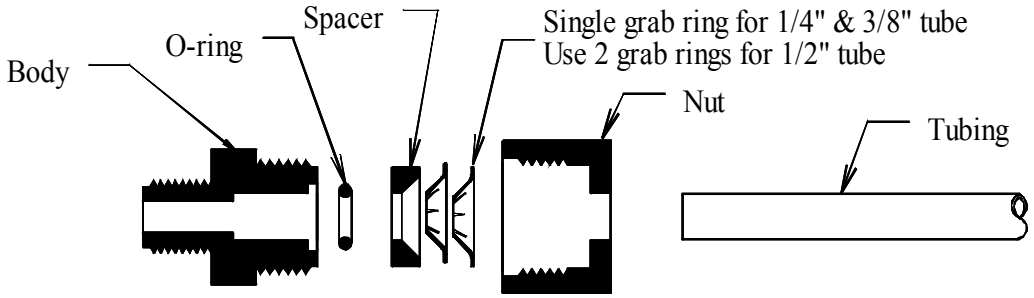
When the system is first started, the 3 -way valve should be set so that it is diverting water to the sampling tap. When the water quality reaches an acceptable level, turn the valve handle 90 degrees to divert the water to the domestic supply tank(s).

If the length of product water tubing supplied with the watermaker is insufficient, use a larger size hose. **Product water flow restriction will cause reduced flow and increased power consumption.**

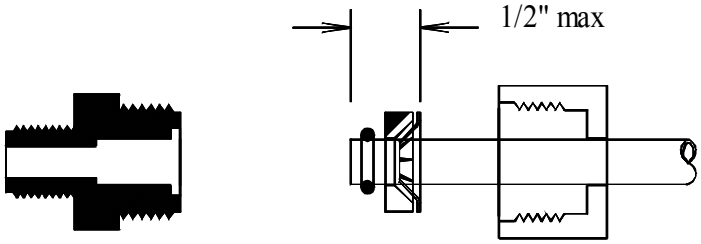
Product Water Piping Schematic



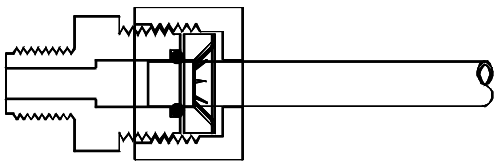
Parker Tube Fitting Assembly Procedure



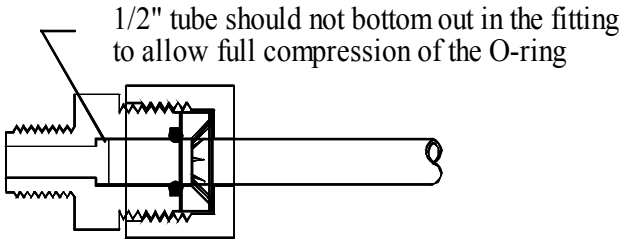
Step 1: Dissemble fitting components



Step 2: Install the Nut first then use the bevelled side of the Spacer to push the Grab Ring onto the tube no more than 1/2". Slip the O-ring over the tube to hold the Spacer in place. If the Grab Ring is pushed too far, trim back the tube so about 1/4" of tube extends past the O-ring.



Step 3: Gently fit the tube into the body and loosely thread on the nut. Be careful not to cross-thread the nut

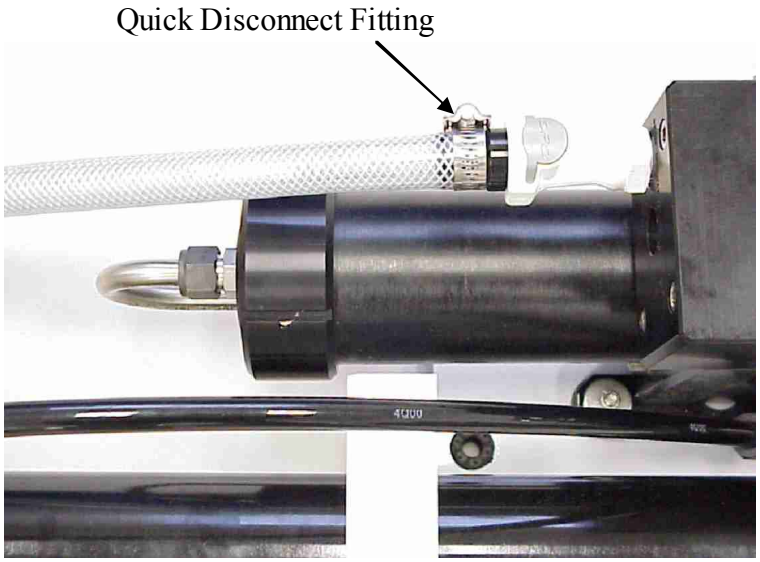


Step 4: Hand tighten the nut. DO NOT OVER TIGHTEN! DO NOT USE A WRENCH! The tube should not come out if pulled by hand. If it does, tighten the grab ring tabs.

1/4", 3/8", 1/2" Parker Tube Fitting Assembly

Brine Discharge

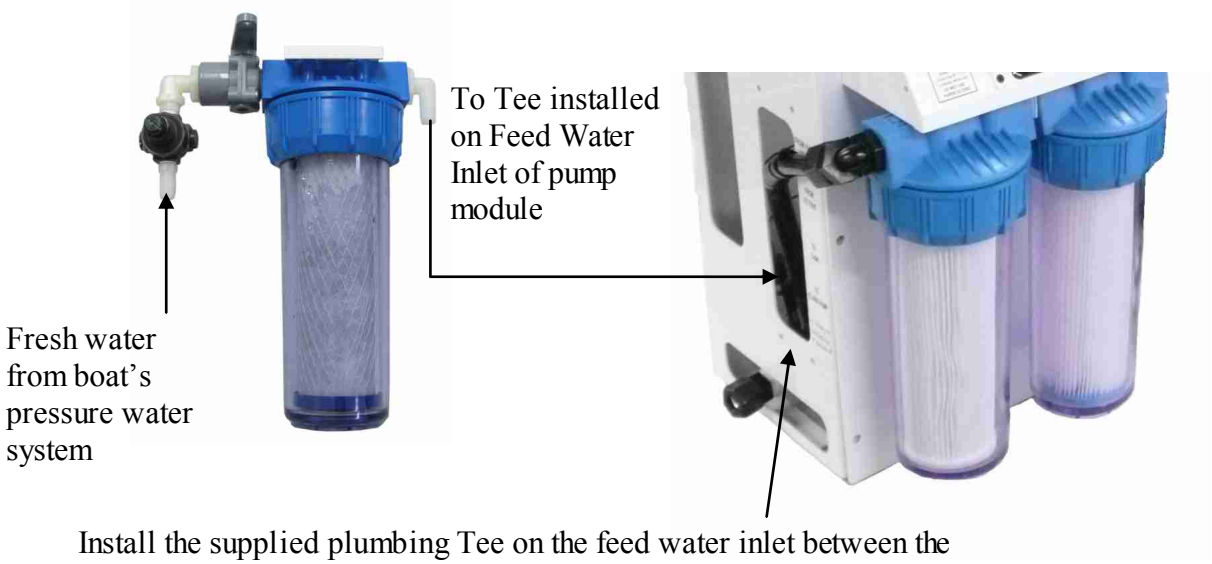
Route the Brine discharge from the quick disconnect fitting to a location above the waterline using the supplied 5/8" hose.



Optional Fresh Water Flush Module

Run a feed line from the domestic cold pressure water system to the 1/2 hose barb on the fresh water flush assembly. This needs to be pressurized for the fresh water flush system to function properly. **The domestic fresh water pump must be able to deliver 1.5 gallons per minute (6lpm) at 25 PSI**. Plumb the outlet of the charcoal filter to the feed water inlet between the 5 micron filter and the feed pump inlet, using the supplied plumbing Tee.

Detailed installation instructions are supplied with the Fresh Water Flush Module.



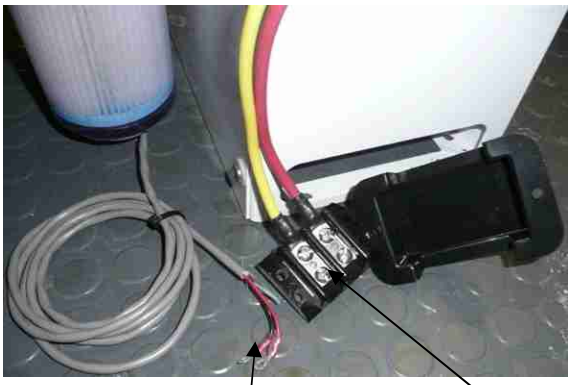
Install the supplied plumbing Tee on the feed water inlet between the 5 micron filter and the feed pump.

Wiring

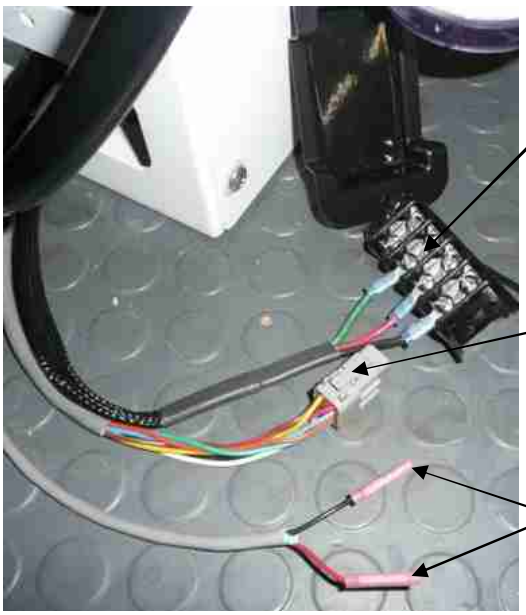
Identify cables that are connected to the Newport Control System.

Newport Mk II Deluxe Systems have a Power Inlet harness with a terminal block and a 2 conductor boost pump cable. A motor speed control sets the run speed and also slows the motor to the flush speed. **Do not install the feed pump module in a hot or poorly ventilated location. Allow for access to the Motor Speed Control inside the feed pump module.**

DC Systems



AC Systems



Wiring (continued)

Mount the main power terminal block in a junction box or on a bulkhead adjacent to the feed pump module. Make sure that this is a dry location well above bilge level and not subject to water spray.

AC wiring connections MUST BE IN A JUNCTION BOX or isolated where they cannot be inadvertently touched. RISK OF INJURY OR DEATH CAN RESULT.

Connect the red and black Boost Pump wires to the corresponding red and black conductors in the Boost Pump cable (red to red, black to black) using the supplied butt connectors, and heat the connectors to waterproof them.

Check the wire size chart to select the proper size power feed to the main power harness. Avoid house breaker panels that could be easily tripped.

Component Sizing:

Newport 400 Deluxe

- 12VDC Use a 30Amp breaker and size the wiring for 25 Amperes.
- 24VDC use a 15 Amp breaker and size the wire for 13 Amperes.
- Provide circuit protection at the source! Inadequate wiring will cause a loss of system performance.

Newport 700/100 Deluxe

- 24VDC use a 30 Amp breaker and size the wire for 30 Amperes.
- Provide circuit protection at the source! Inadequate wiring will cause a loss of system performance.
- 110 VAC use a 15 Amp breaker and size the wire for 7 Amperes.
- 220 VAC use a 10 Amp breaker and size the wire for 10 Amperes.

Note: If the specified circuit breaker sizes are unavailable use the next higher rating but do not exceed the specification by more then 10%. All wiring to be done to applicable ABYC, Marine UL or CE standards.

Wire Size Chart on Next Page →

DC WIRE SIZE CHART

Newport 400 MkII 12V DC System Wiring

Wire Length FT. MkII 12V	Meters	AWG.	SQ MM
10	3	8	10
15	4.5	6	16
20	6.1	4	25
25	7.6	4	25
30	9.4	2	35
35	10.6	2	35
40	12	2	35
45	14	2	35
50	15	1/0	50

MkII 24V	Meters	AWG.	SQ MM
10	3	14	2.5
15	4.5	12	4
20	6.1	10	6
25	7.6	10	6
30	9.4	8	10
35	10.6	8	10
40	12	8	10
45	14	8	10
50	15	6	16

Distances are shown one-way, from the DC Supply to the Feed Pump Module.

Wire gauge should be determined by the sum of the Positive and Negative wires.

Example: 7 feet of wire is needed to connect the DC electrical panel to the Feed Pump Module on a 24 volt system. In order to determine what type of wire you need, add the positive and negative wire lengths: 7 + 7 = 14.

14 > 10

Since 14 is greater than 10, size the wire for 15': 12 AWG / 4SQ MM wire.

Newport 700/1000 Mk II Deluxe Wiring

MkII 24V

Wire Length	Meters	AWG.	SQ MM
10	3	10	6
15	4.5	8	10
20	6.1	8	10
25	7.6	6	16
30	9.4	6	16
35	10.6	4	25
40	12	4	25
45	14	4	25
50	15	4	25

Distances are shown one-way, from the DC Supply to the Feed Pump Module.

Wire gauge should be determined by the sum of the Positive and Negative wires.

Example: 7 feet of wire is needed to connect the DC electrical panel to the Feed Pump Module on a 24 volt system. In order to determine what type of wire you need, add the positive and negative wire lengths: 7 + 7 = 14.

14 > 10

Since 14 is greater than 10, size the wire for 15': 8 AWG / 10SQ MM wire.

110 Volt AC System Motor Wiring

Use a 15 amp circuit breaker

Wire Length	AWG wire size	Square MM wire size
To 25 feet (7.5M)	12 awg	3 sq mm
25 feet to 50 feet (7.5M to 15M)	10 awg	5 sq mm
50 feet to 75 feet (15M to 23M)	8 awg	8 sq mm

220 Volt AC System Motor Wiring

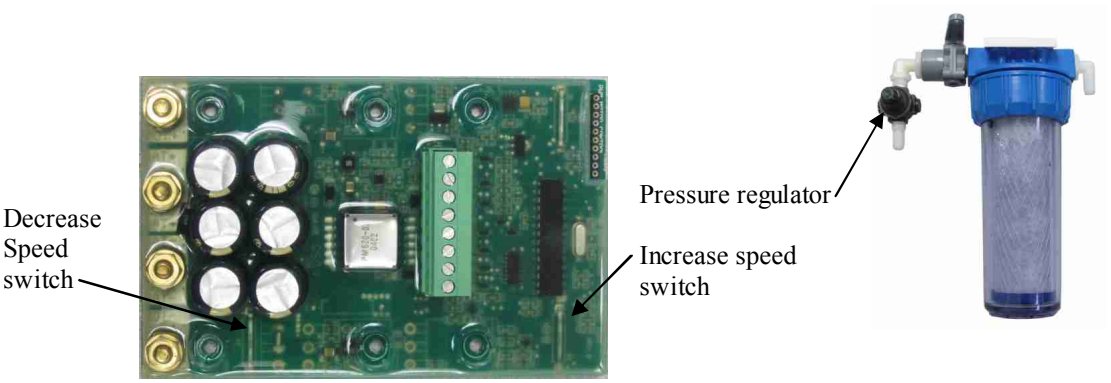
Use a 10 Amp circuit breaker

Wire Length	AWG wire size	Square MM wire size
To 25 feet (7.5M)	14 awg	2 sq mm
25 feet to 50 feet (7.5M to 15M)	12 awg	3 sq mm
50 feet to 75 feet (15M to 23)	10 awg	5 sq mm

Flush Cycle Adjustment
For Optional Fresh water Flush Module

Before shipping from the factory the Newport watermaker flush cycle is set to factory default settings. After initial start up, and annually thereafter, the flush cycle should be checked. The water going overboard at the end of the flush cycle should not taste salty (<1000ppm). If the water at the end of the flush is still salty, or to minimize the use of fresh water during the flush cycle, follow these instructions to optimize the cycle.

First adjust the flush water pressure regulator. Remove the 1/2 inch vinyl flush water hose where it attaches to the flush water inlet fitting at the feed pump module. Open the gray flush valve on the charcoal filter. Water will begin to flow out of the flush water tube. Using a graduated container, allow the water to flow into the container for exactly thirty seconds, then close the gray flush valve. If more than 3 quarts (3 liters) of water went into the bucket the pressure regulator is set too high, if less the 2 quarts flow into the bucket the pressure is too low. Adjust the regulator by loosening the lock nut and turning the adjusting screw. Test again until the correct flow is achieved. Reconnect the Flush water tube.



Next adjust the feed pump flush speed Mounted inside the Feed Pump Module is a pump speed controller. On the board are two magnetic reed switches for adjusting the pump motor rpm. The switches are narrow silver-colored bars about 1/2" (1.5cm) long. The Increase Speed switch is labeled S2 and is located near one corner of the board. The Decrease Speed switch is labeled S3 and is located next to the six cylindrical capacitors. Each time a small magnet is placed near the switch while the pump is running, a signal will be sent to the controller, changing the speed setting, and the pump will speed up or slow down slightly.

Adjust the flush speed as follows: Open the gray flush valve and turn on the flush switch. After the feed pump starts, close the service valve on the Boost Pump Module (handle crossways). If the feed pump begins to make a grinding noise then the pump is going too fast and needs to be slowed down. Turn the service valve on the Boost Pump Module to Service and remove the hose bib cap. Water should flow very slowly out of the service hose fitting. If flow is more than a trickle, speed up the pump. Optimum flush speed will be the speed at which slightly more water is coming from the flush module than the feed pump is pumping. This setting will ensure that no sea water is drawn in during the flush, but fresh water is not being wasted overboard.

Connection of Optional Accessories

Use of any external devices not approved by the factory may cause permanent damage to the system and are not covered by the Spectra warranty.

Fresh Water Flush Module: This assembly is designed to make fresh water flushing your Newport Deluxe faster, easier and more convenient. The assembly contains a charcoal filter, flow regulator, and ball valve. The inlet to the filter connects to the pressurized side of the domestic fresh water system. The outlet of the filter housing tees into the inlet side of the feed pump.

Remote Gauge Panel: The remote gauge panel allows users to operate and monitor the system from a remote location. It contains a product water flow meter to measure the volume of water going to the tanks, a pressure gauge to monitor filter condition, a switches to turn on the system from virtually anywhere in the vessel.

Local Gauge Assembly: The local pressure gauge assembly will allow users to monitor the feed water pressure at the Clark Pump. This can be a invaluable diagnostic tool in the field, allowing to easily determine the condition of the feed pump, Clark Pump and membrane(s) without hiring a technician.

Optional Z-brane System: Detailed instructions are included in the Z-Brane section. Connect to an uninterruptible 12 of 24Volt DC power source.

Ultraviolet Sterilizer: Detailed instructions are included with the sterilizer kit. The UV sterilizer lamp module and ballast unit should mount vertically, with the product water inlet at the bottom, outlet at the top. The ballast wires plug into the end of the bulb in the lamp module. The ballast RED wire connects to a fused DC Positive source of appropriate voltage, and the black wire connects to a DC Negative. If the wires must be extended, use minimum 16AWG wire.

New System Start-Up and Testing

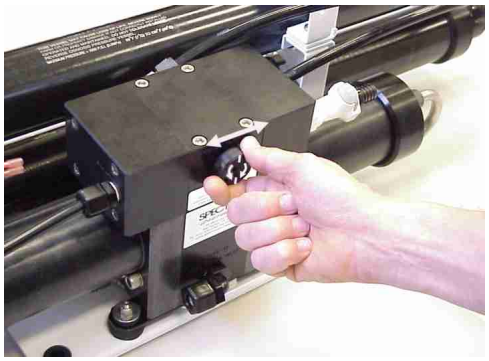
Avoid running the system if the vessel is in contaminated water, such as in a harbor or canal. The system should be fully run tested before leaving port. **It is preferable to sacrifice a filter by running the system in turbid water rather than waiting to get offshore to discover a problem or deficiency in the installation.** If the location or weather prevents proper testing refer to the section "Dry Testing."

Warning! Damage may occur if the purge sequence is bypassed and the membrane is pressurized with storage chemical in it.

1. First Check That:

   - **Thru-hull valve is open**
   - Three way **product valve is set to Sample**, diverting the product water away from the tank.

2. **Remove the warning tag and rubber spacer** from under the pressure relief valve knob and make sure the **pressure relief valve is open 1/2 turn**.



3. **Power up** the system. *If the system starts immediately when power is applied to the system and the 'Flush LED' blinks, press the 'Flush' button at either panel to stop the system.*

4. **Press the Run Button** on the local or remote panel. The feed pump and boost pump will come on continuously. Run the watermaker for 20 minutes with the pressure relief valve open to Purge the storage chemicals out of the membrane. **Make sure that the feed pump is not cavitating or drawing in air on the intake side. Check for leaks.**

5. **After 20 minutes, close the pressure relief valve.** Product water will begin to flow from the Sampling port.

6. **Check for leaks.** After 10 minutes, **check the flow meter for air bubbles** in the product. If there is air in the product after a few minutes of operation, you may have an air leak in the suction side plumbing.

7. **Sample the product** water with your handheld meter. If the water tastes good and the salinity is less than 500 ppm you can **turn the sampling valve to the run position** and begin filling your tank.

8. When finished making water **perform a fresh water flush** according to the "Fresh Water Flush Cycle" Instructions. **Test the brine overboard water** at the end of the flush cycle to ensure that the water remaining in the machine is **below 1000ppm salinity.** The feed pump and membrane will be damaged if allowed to sit idle while full of salt or brackish water.

Dry Testing With Artificial Ocean

If it is not possible to test run the system in the water that the vessel is located, testing may be accomplished with an artificial ocean. Purchase enough salt to make 5 gallons (20 liters) of salt water. A "standard" ocean contains 32 grams of salt per Liter of water, or 3% salt by weight.

Obtain 25 - 30 gallons of unchlorinated fresh water. If the optional Fresh Water Flush module has been installed then this can be used to de -chlorinate dock or tank water and follow the instructions on the next page titled "Dry Testing with the Fresh Water Flush Module Installed".

1. **Open the Pressure Relief Valve on the Clark Pump.**
2. Power up the system. *If the system starts immediately when power is applied to the system and the 'Flush LED' blinks, press the 'Flush' button at either panel to stop the system.*
3. **Close the seacock**
4. **Connect the service intake hose to the boost pump module**, and route it into the unchlorinated fresh water supply bucket or tank.
5. **Run the product water tube from the membrane end cap to the supply bucket or tank**.
6. **Turn the valve on the boost pump module from "Run" to "Service."**
7. **Run the Feed Pump by pressing the 'Flush' button**. Continue running the system, drawing water from the fresh water supply bucket, until all the storage chemical has been purged from the system. Obtain additional unchlorinated fresh water if necessary.
8. Make sure that there is at least 5 gallons of unchlorinated water remaining in the supply. Slowly begin adding salt, until the ratio reaches **32grams of salt per Liter of water**.
9. **Connect the Brine Discharge Service hose to the quick disconnect on the Clark Pump** and route it into the supply bucket.
10. Close the pressure relief valve and start the system using the ' **Start' Button**.
11. Run and test the system for as long as possible. During the run test carefully inspect for leaks. Check all of the system parameters to make sure the system is operating correctly. **Do not allow the water in the bucket to get above 120F (50C).**
12. Store the system per the "Storage" instructions, or fresh water flush the system as per the instructions in this manual.

Dry Testing With Fresh Water Flush Module Installed

The optional Fresh Water Flush module can be used to de -chlorinate dock or tank water, and can be used to easily purge storage chemical from a pickled watermaker. Make sure that the domestic water pressure system is turned on and that the vessel's storage tanks have at least 30 gallons of water inside.

1. **Open the Pressure Relief Valve on the Clark Pump**
2. Power up the watermaker and the domestic fresh water supply pump. *If the system starts immediately when power is applied to the system and the 'Flush LED' blinks, press the 'Flush' button at either panel to stop the system.*
3. **Close the seacock**
4. Open the Flush Valve on the Fresh Water Flush Module and push the 'Flush' button. Allow the system to flush with unchlorinated fresh water for 20 minutes.
5. **Press the 'Flush' button again to turn off the feed pump.**
6. **Connect the service intake hose to the Boost Pump Module and the brine discharge service hose to the Clark Pump brine discharge**, and route them into the unchlorinated fresh water supply bucket or tank.
7. **Run the product water tube from the membrane end cap to the supply bucket or tank**.
8. **Turn the valve on the boost pump module from "Run" to "Service."**
9. Make sure that there is at least 5 gallons of unchlorinated water in the supply bucket. Slowly begin adding salt, until the ratio reaches **32grams of salt per Liter of water**.
10. Close the pressure relief valve and start the system using the ' **Start' button**.
11. Run and test the system for as long as possible. During the run test carefully inspect for leaks. Check all of the system parameters to make sure the system is operating correctly. **Do not allow the water in the bucket to get above 120F (50C).**
12. Store the system per the "Storage" instructions, or fresh water flush the system as per the instructions in this manual.

Normal Start Up

If the system contains preservative or cleaning chemicals follow the directions for New System Startup or Membrane damage will occur!

- **Turn the 3 way Product Valve to the 'Sample' position**, to divert water away from the storage tanks.
- **Check the prefilter bowls to ensure that they are full of water.** If they are empty or have large air gaps at the top of them, it is advisable to open the pressure relief valve for the first 1 -2 minutes of operation to bleed air out of the system.
- **Press the 'Start' button** on the local or remote panel (if installed). The feed pump and boost pump will run continuously.
- **Check to make sure that there are no air leaks on the intake line**, and that the feed pump is running smoothly. **If the pumps makes a grinding noise shut the system down,** replace the prefilters, and check for leaks on the intake line.
- Pressing the **Stop button** stops the feed pump at any time.
- **Test the product water at the sampling tap**, if the water is below 750 parts per million then turn the 3 Way product valve to divert the water to the storage tanks.
- For optimum performance, run the system as long as possible at one time. **Never let the system sit with salt water in it.** Never allow continuous air leaks in the intake.

Normal Shut Down

- Pressing the Stop button on either the local or the remote gauge panel at any time will shut off the system.
- It is strongly recommended that the system is fresh water flushed at the termination of each run cycle, then once per week for every week that the system sits idle and is not pickled.
- Follow the instructions for Fresh water flushing on the next page.

Fresh Water Flush

- Turn the product diversion valve to sample and fill a bucket with product water.
  Estimate 6 US Gal (23L) of water per flush for a Newport 400 Mk II Deluxe
  7 US Gal (26.5L) of water per flush for a Newport 700 Mk II Deluxe
  8 US Gal (30L) of water per flush for a Newport 1000 Mk II Deluxe

- Make sure that the pressure relief valve is closed. It should be closed if the system was just used to make water.

- The power for the system must remain on during the flush mode. Turning off the power will disable the pump and damage may occur.

- **Connect the Intake Service Hose to the hose bib on the Boost Pump Module,** and lead the open end to the bucket of product water.

- **Turn the Yellow Service Valve on the Boost Pump Module to the 'Service' position** and press the 'Flush' button.

- *Flush the system for 6—8 minutes, or until the salinity of the water in the brine discharge drops below 1000ppm.*

- Press the 'Flush' button again to shut down the system, and turn the valve on the boost pump module back to 'Run'.

- The system can be left in this state for up to 1 week, before it is recommended that you perform another fresh water flush or follow the long term storage procedure.

Boost Pump Module

Fresh Water Flush
With Optional Fresh Water Flush Module

- Make sure there is enough water in the fresh water supply system to supply the watermaker.
  Estimate 6 US Gal (23L) of water per flush for a Newport 400 Mk II Deluxe
  7 US Gal (26.5L) of water per flush for a Newport 700 Mk II Deluxe
  8 US Gal (30L) of water per flush for a Newport 1000 Mk II Deluxe

- Make sure that the pressure water supply is on and will stay on during the flush mode (If this is not possible contact your certified dealer.).

- Make sure that the pressure relief valve is closed. It should be closed if the system was just used to make water.

- The power for the system must remain on during the flush mode. Turning off the power will disable the pump and damage may occur.

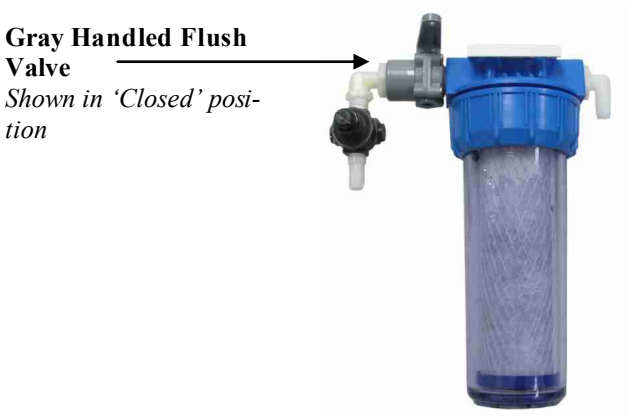
- Open the gray flush valve on the Fresh Water Flush Module. This will begin the flow of fresh water to the membrane.

- Wait 30 seconds, then press the 'Flush' button. This will allow the pre-filters to backflush and can extend the life of the filters significantly.

- Flush the system for 5 —7 minutes, or until the salinity of the water in the brine discharge drops below 1000ppm.

- Press the 'Flush' button to turn off the feed pump, wait 30 seconds then close the gray flush valve on the Fresh Water Flush Module.

- The system can be left in this state for up to 1 week, before it is recommended that you perform another fresh water flush or follow the long term storage procedure.



Fresh Water Flush Module

Long Term Storage Procedures

Watermakers are best run continuously. When not in use, biological growth in the membrane is the leading cause of membrane fouling. A warm environment will cause more growth than a cold environment. Routinely fresh water flushing system will greatly reduce biological growth but may not stop it completely in certain conditions. If an optional Z – Brane Water Treatment System is installed in the system, the weekly fresh water flush will maintain the system as long as unchlorinated pressurized fresh water is provided and the power remains on.

System Storage or "Pickling"

If the system is to be left unused for more than 2 weeks, perform the following storage procedure. The procedure introduces a chemical compound into the system that prevents biological growth. This procedure requires de-chlorinated water which can be made with the optional Fresh Water Flush Module or by filling a bucket with product water from the watermaker. **Charcoal filters last a maximum of 6 months once wetted.**

Spectra SC-1 a special storage compound used by the US Navy. It is formulated to be compatible with the modern engineering plastics and composites in the Spectra pumps. Do not use any substitute except propylene Glycol. SC-1 Storage Compound has to be mixed at a ratio of 1 Spectra container to 3 gallons (12L) of fresh water to have the proper solution. An average of 2 gallons (8L) of water is in a Newport System. This water has to be figured in to the mixture.

Caution! Avoid contact with skin, eyes, or lungs with the storage chemical.

SPECTRA
Spectra Storage Compound
STORAGE: add 1 container (8 oz) to 3 gallons of unchlorinated
NOTE: include water that is in the system in the mix ratio.
Consult the Operation Manual for detailed procedures. 3/6/01

Storage Procedure:

- Step 1: Flush the system twice, following the appropriate instructions for fresh water flushing, leaving 1 gallon of fresh unchlorinated water in a clean service bucket.

- Step 2: Connect the intake service hose to the hose bib on the Boost Pump Module and connect brine discharge service hose to the quick connect fitting on the Clark Pump. Lead both hoses into the service bucket.

- Step 3: Mix the storage chemical compound into the water in the bucket. *It is possible that not all storage chemical will dissolve completely, this is normal.*

Pressure Relief Knob

- **Step 4:** Make sure the pressure relief valve on the Clark pump is Open 1/2 to 3/4 of a turn (unpressurized).

- Step 5: Press the 'Flush' button on the pump module or the remote gauge panel to turn on the feed pump. Circulate the storage chemical in the system for approximately 20 minutes. Press the 'Flush' button again to turn off the feed pump when finished.

Clean Up:

- Remove the quick disconnect from the Clark pump brine discharge, and replace the original hose that leads to the thru -hull. You may at this point pump the bucket dry by using the feed pump 'flush' button. Stop when the bucket is empty.

- Turn the service valve 180° back to its original position, and remove the service hose.

- Turn off the power to the system.

- LEAVE THE PRESSURE RELIEF VALVE OPEN

Storage & Winterizing

Warning! Use only potable water antifreeze (Propylene Glycol).
Do NOT use automotive antifreeze (Ethylene Glycol).

Winterizing Procedure:

- Step 1: Flush the system twice, following the appropriate instructions for fresh water flushing.
- Step 2: Fill a large bucket with 3—4 gallons (11—15L) of Propylene Glycol.
- Step 3: Connect the intake service hose to the hose bib on the Boost Pump Module and connect brine discharge service hose to the quick connect fitting on the Clark Pump. Lead both hoses into the service bucket.

- **Step 4:** Make sure the pressure relief valve on the Clark pump is Open 1/2 to 3/4 of a turn (unpressurized).
- Step 5: Press the 'Flush' button on the pump module or the remote gauge panel to turn on the feed pump. Circulate the Propylene Glycol in the system for approximately 20 minutes. Press the 'Flush' button again to turn off the feed pump when finished.

Clean Up:

- Remove the quick disconnect from the Clark pump brine discharge, and replace the original hose that leads to the thru -hull. You may at this point pump the bucket dry by using the feed pump 'Flush' button. Stop when the bucket is empty.
- Turn the service valve 180° back to its original position, and remove the service hose.
- Turn off the power to the system.
- LEAVE THE PRESSURE RELIEF VALVE OPEN

Maintenance

General

Periodically inspect the entire system for leaks and chafe on the tubing, hoses and cables. Repair any leaks you find as soon as practical. Some crystal formation around the Clark pump blocks is normal. Wipe down any salt encrusted areas with a damp cloth.

The Seawater Strainer

- The sea water strainer's stainless steel element should be inspected, removed, and cleaned as needed. A clogged strainer will cause the shut down. Be careful to ensure that the thru - hull is closed before disassembly and the seal and element are in place before reassembly. Put the screen up to a light for inspection. When the system is put into storage, remove, rinse, and reassemble dry to impede corrosion. Check frequently during operation.

The Prefilters

- Once the prefilter are blocked the system will automatically shut down. Replace the filters when they appear dirty, or when the system shuts down. Whichever occurs first.
- If the remote gauge panel is installed, replace the filters when the filter condition gauge reaches 8—9psi, or when the system shuts down, whichever occurs first.
- To extend the service life of the filters, GENTLY rinse them with fresh water after each run cycle, allow them to dry in open air, then reinstall before using again.
- **Do Not Clean filter more than 3 times, or permanent system damage may occur.**
- To service the filters, shut off the thru -hull, open the housings, discard the old filters, Clean out the housing bowls, reassemble the housings with new 20 and 5 micron filter elements. The 5 micron filter goes downstream from the 20 micron. Leave dry until next startup.
- Use only Spectra approved filters or you may void your warranty. Occasionally, lightly lube the O-rings with silicone grease.

The Charcoal Fresh Water Flush Filter

- Replace the charcoal filter element at least every 6 months.
- Use only Spectra approved charcoal filters or permanent membrane damage may occur

The Membranes

- The membranes need to be cleaned only when operating pressures have risen more than 10% or the product quality degrades. The leading cause of fouling in marine use is from biological growth that occurs when the system is left unused without flushing or pickling. Fouling from mineral scaling can happen during operation under certain sea water conditions, and from rust. Monitor the product salinity and feed pressure gauge (if installed) for higher than normal readings for the conditions. Other conditions can cause high pressure such as cold feed water or clogged filters. Low product flow is usually due to low voltage, damaged feed pump or Clark pump. Look for all other causes before cleaning the membrane. Membrane life can be shortened by excessive cleaning.

- There are two types of cleaners: acid and alkaline. The acid cleaner (SC-3) will remove mineral scaling. The alkaline cleaner (SC-2) is used to remove biological by-products, oil, and dirt particles that get past the prefilters. If membrane performance is reduced and they have not been pickled recently, cleaning with both chemicals is recommended. The acid cleaner should be used first. If the membrane fails to respond to both cleanings, this is an indication of another problem with the system, or that it is time to replace the membrane. Contact Spectra Watermakers before removing a membrane.

Membrane Cleaning

For normal cleaning, the SC-3 Acid Cleaning Compound is used first, then the SC -2 Alkaline Cleaning Compound. If known bio -fouling is present, the SC-2 may be used first. Using hot water if possible, up to 120° (45C) is recommended as it greatly enhances the ability of the cleaners to do their jobs.

If the history of the system is unknown or has been left "unpickled" for an extended length of time and biological growth is present, it is recommended that the system is cleaned with SC -2, using an alternate source of unchlorinated fresh water before the system is run under pressure. A simple test can be performed to see if biological growth has occurred. Before running the system, remove the prefilters and examine their condition If the housings are full of smelly discolored water, the system was not properly stored. Install clean prefilters if they were bad. Next check the membrane. Attach the brine discharge service hose and lead to a bucket. Open the pressure relief valve one turn, and manually run the system for 30 seconds. Examine the brine water: if it's discolored and smells bad, perform an SC-2 cleaning with an alternate source of unchlorinated water before running the system pressurized. If the brine is fairly clean, the system can be purged, run normally, and checked for performance. Clean the membranes only if performance is reduced.

Heating the water is preferable. One way to do this is to find a camp stove and use a large stainless steel pot to heat the solution in. The cleaning solution throughout the system will heat as it circulates in and out of the pot. An alternative is to heat the one or two gallons of initial water to 120° on the main stove before mixing in the cleaner and circulating it into the system. Periodically stop and reheat the solution.

Perform the cleaning procedures while the ship is in acceptable sea water for purging and testing .

Note: Procedures are the same for the SC-2 and SC-3 cleaners

Warning! The pressure relief valve on the Clark pump must be open for this procedure or membrane damage may result. Maximum pressure 50 psi.

A Spectra Cleaning Compound (SC-2 or SC-3) must be mixed with fresh water at a ratio of 1 container of compound to 3 gallons (12L) of unchlorinated water to have the proper solution. The water already in the system has to be figured into the mixture. SC -2 and SC-3 are never mixed together. Do not use them for storage pickling solution.

Storage Procedure:

- Step 1: Flush the system twice, following the appropriate instructions for fresh water flushing, leaving 1 gallon of fresh unchlorinated water in a clean service bucket.

- Step 2: Connect the intake service hose to the hose bib on the Boost Pump Module and connect brine discharge service hose to the quick connect fitting on the Clark Pump. Lead both hoses into the service bucket.

- Step 3: Mix the storage chemical compound into the water in the bucket. *It is possible that not all storage chemical will dissolve completely, this is normal.*

- **Step 4:** Make sure the pressure relief valve on the Clark pump is Open 1/2 to 3/4 of a turn (unpressurized).

- Step 5: If possible, heat the solution to 120 deg F (48 deg C). The cleaning chemicals are much more effective the closer the solution is kept to this temperature.

- Step 6: Press the 'Flush' button on the pump module or the remote gauge panel to turn on the feed pump. Circulate the storage chemical in the system for approximately 20 minutes. Press the 'Flush' button again to turn off the feed pump when finished.

Clean Up:

- Remove the quick disconnect from the Clark pump brine discharge, and replace the original hose that leads to the thru -hull. You may at this point pump the bucket dry by using the feed pump 'Flush' button. Stop when the bucket is empty.

- Turn the service valve 180° back to its original position, and remove the service hose.

- Turn off the power to the system.

- LEAVE THE PRESSURE RELIEF VALVE OPEN

Suggested Spares

Short term cruising, weekends etc.

We suggest a basic cruise kit. Kit consists of 3 ea, 20micron, and 5 micron filters and two SC -1 storage chemicals.

Cruising 2 to 6 months at a time.

Two basic cruise kits, One each replacement charcoal filter. One replacement feed pump head.

Longer than 6 months,

Additional filters, offshore cruising kit consisting of Clark pump seals, O-rings, tools and membrane cleaning chemicals. One replacement strainer screen, O -ring for strainer screen, O-rings for filter housing

Spectra Watermakers parts list:	**Part Number**
SC-1 STORAGE CHEMICAL	KIT-CHEM-SC1
SC-2 CLEANER	KIT-CHEM-SC2
SC-3 CLEANER	KIT-CHEM-SC3
BASIC CRUISE KIT B	KIT-BCK-B
5 MIC FILTER	FT-FTC-5
20 MIC FILTER	FT-FTC-20
CHARCOAL FILTER	FT-FTC-CC
6” STRAINER SCREEN	FT-STN-6S
FEED PUMP HEAD	PL-PMP-140MAG
6” STRAINER O-RING	SO-STN-6SS
FILTER HOUSING O-RING	SO-FHS-10H
OFF SHORE KIT	KIT-OFFSH
40” MEMBRANE	FT-MB-40

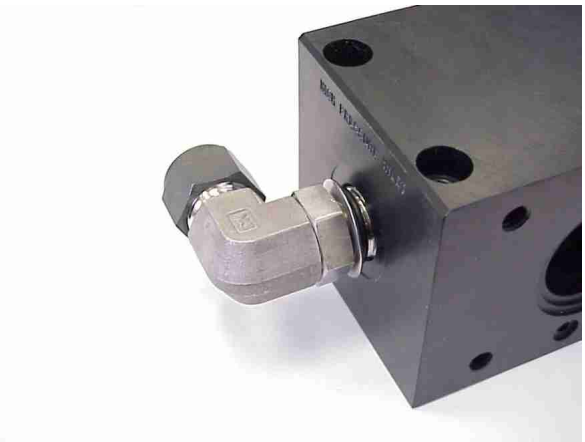
Membrane Pressure Vessel Relocation

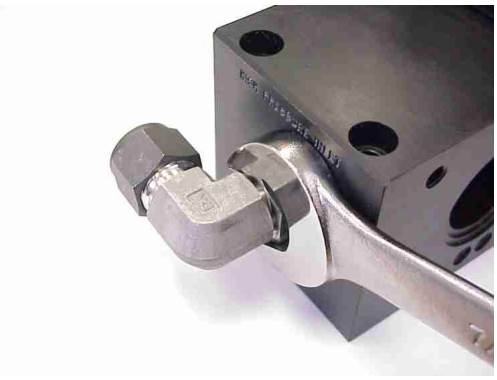
Use **ONLY** Dayco Imperial Nylo-Seal 88-NSR-1/2 tubing for high pressure connections. Pay attention to the direction and flow path of the tubing before disassembly. Make sure that you reinstall the tubing in the same manner. Rotate the 90 degree high pressure tube fittings on the Clark pump for ideal tube runs. The high pressure fittings are typically pre - installed at the factory. These fitting seal with an O -ring and require no Teflon tape or pipe dope. Loosen the backing nut rotate the fitting and reseat the backing nut.

Follow the high pressure tube connection instructions on the next page. Connect the tubes to one of the components, secure the tube runs, and then trim and connect to the other component. A 90 degree bend in a tube is better than a 90 degree fitting. A tube, when mounted, should have at least ***one gentle bend*** to allow for expansion. **Do not connect a tube straight between hard mounted fittings.**

When connecting the tubes to their components, be sure to hold the fitting body with a wrench during the final tightening. Of special note are the stainless steel tube fittings on the membrane housing seal on an O -ring and should be seated all the way in. Hold the fitting with a wrench while installing the tube.

The fittings on the Clark pump have an O -ring seal and can be re-oriented by backing out the O-ring Stop nut. Rotate the fitting to align with the tube and tighten the nut **just past hand tight. Do Not over tighten!**





Spectra High Pressure Tube Fitting Assembly

Use **ONLY** Dayco Imperial Nylo-Seal 88-NSR-1/2 tubing for high pressure connections.

Carefully fit and measure the tubing before cutting with a sharp razor knife or hose cutter and remove any burrs. Minimum tubing bend radius is 6". Route tubing away from excessive heat sources and secure from vibration and chafe. Have at least one shallow bend in a tube assembly after it is installed.

Refer to figure 1. If a fitting has been dissembled, reassemble as illustrated. The notch on the ferrule must engage the inside of the nut properly for the nut to seat down fully. Once the tube is inserted the ferrule and nut will naturally align.

Refer to figure 2. Insert tube fully into the fitting, it should go in 0.9". Tighten the nut finger tight while moving the tube around to prevent binding. One thread should be showing under the nut. Secure the tube so it won't back out when tightening.

Refer to figure 3. Use 13/16" wrench to hold a straight body fitting or a 3/4" wrench for a 90º body, and a 7/8" wrench for the nut. Hold the body, recheck the tube insertion, then tighten the nut 1 -1/4 turns. Use the index mark on the nut as a guide. The threads should be completely covered by the nut.

Make Sure these fittings are tight on initial assembly or they will fail!

The correct Torque is specification is 85 foot pounds

Figure 1.

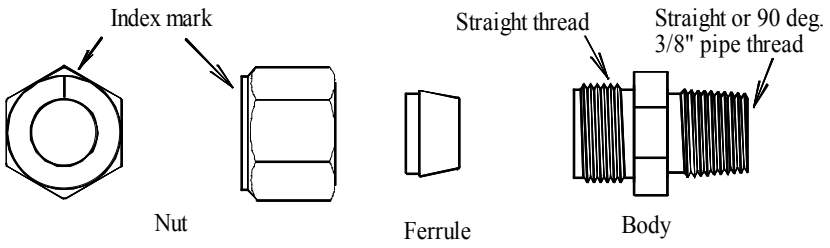


Figure 2.

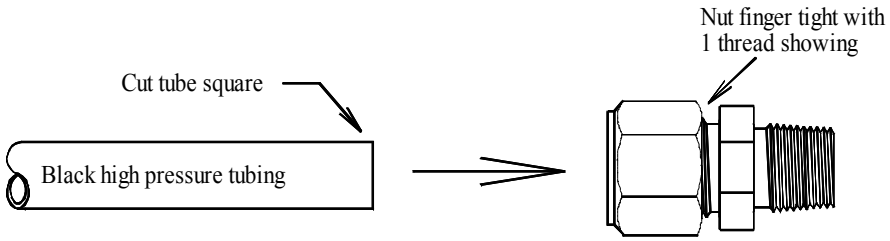
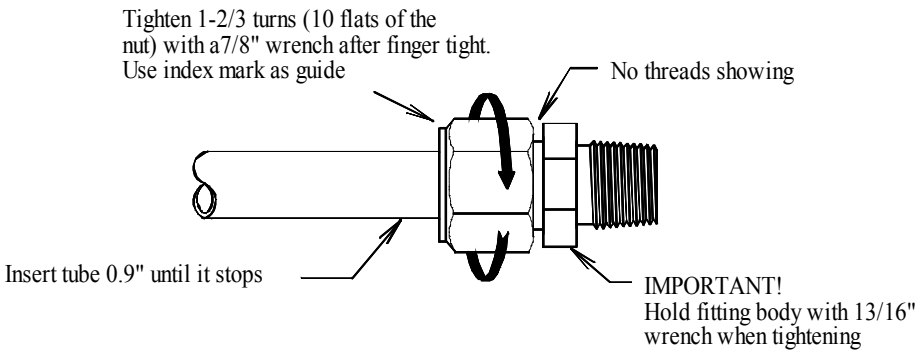


Figure 3.


Tighten 1-2/3 turns (10 flats of the
nut) with a7/8" wrench after finger tight.
Use index mark as guide
No threads showing
Insert tube 0.9" until it stops
IMPORTANT!
Hold fitting body with 13/16"
wrench when tightening

Spectra Watermakers Newport Troubleshooting Procedures

SYMPTOMS	PROBABLE CAUSE	REMEDY
System stops mid-cycle, won't stay running	Pre-filters blocked Sea Strainer Clogged High Feed Pressure	Replace Pre-Filters Clean Sea Strainer Clean Membrane(s)
System does not operate	- No power to control box	- Check and reset main DC supply breaker - Check for voltage (12 or 24vDC) at control box power input studs
System runs, no product water delivered to water tanks	- diversion valve set to sample - disconnected or broken product tubing	- Turn diversion to deliver water to tank - Check product tubing
Feed pump runs with loud noise	- Intake blocked - Air in system	- Check thru-hull valve - Check sea strainer for leaks - Check FWF module for leaks - Re-prime system (restart)
Product water quality diminishing	- Warmer feed water temperature - Feed pump worn - Low voltage to feed pump motor - Membrane	- Normal, no action required - Replace feed pump - check electrical connections - Clean or replace membrane
Product water volume diminishing	- Low voltage to feed pump motor - Worn feed pump - Clark Pump problem	- Check electrical connections - Replace feed pump - Contact Factory

Operation and Repair Bulletins

The following documents are sections of our complete service bulletin set. These are available on our website Spectrawatermakers.com

MB-2 MEMBRANE CARE

Membrane life is affected by a large number of factors and is somewhat unpredictable. A big commercial plant running 24/7 will get 10 to 12 years out of a set of membranes. But they do all kinds of fancy chemical injections and never shut the thing off. Most cruisers are lucky to get five or six years out of one. You hear of the eight or ten year old membrane now and then. The biggest killers of membranes are lack of use, chlorine damage, and improper storage.

Don't let membranes sit around with sea water or stale fresh water in them. Biological growth will occur in the membrane. Here at the factory we frequently get back membranes for inspection that reek of hydrogen sulfide (rotten eggs). This odor is produce by anaerobic bacteria that live in an unused membrane, feeding on whatever animal or vegetable matter is trapped in it from the plankton that gets through the system. Membranes badly fouled in this way can seldom be saved. These bacteria are always present but are inhibited by the oxygen in sea water while the unit is in frequent use, by scheduled fresh water flushes, or by pickling. Keeping the prefilters clean is also important in preventing bio-fouling. If your prefilters are allowed to become a breeding ground for bacteria (get smelly), the contamination will spread throughout the system. When we cut open a failed membrane we also find mildew, another form of bio fouling, probably due to long term storage with no biocide or stale biocide.

After many hours of water making mineral deposits will form and must be dissolved away with an acid cleaner. Alkaline cleaners are used for bio-fouling. Cleaning chemicals, especially the alkaline, are not good for the membrane. Every time you clean the membrane it shortens its life. Clean only when necessary, and avoid cleaning as a "diagnostic tool".

Chlorine will destroy a membrane in minutes. It attacks the material that the membrane is made from. Always use product water or water filtered slowly through a charcoal filter for flushing and chemical treatments.

Oil simply plugs up the matrix of the membrane and clogs it up. We have brought back oil fouled membranes with Joy soap (See MB-5 Cleaning with Detergent.)

For storage we recommend using propylene glycol potable water system antifreeze if available. It can safely be left in the system for one year and will keep things from freezing in cold conditions. It is hard to find in warm climates, and takes up a lot of room on a small boat, so our SC-1 is best for tropical cruising.

Given good care a membrane will eventually just start to slowly fade away. The feed pressure may rise and/or the ppm go up. Hardly ever will they just fail overnight.

MB-5 MEMBRANE CLEANING WITH DETERGENT

If the membrane has been fouled with oil it may be possible to save it by cleaning it with dish soap such as Joy. Don't use anything that may contain bleach. You will need quite a lot of chlorine free fresh water. If using shore water run it through a charcoal filter at a rate of not more than 1.5 gallons (6 liters) per minute.

Fill a bucket with fresh water and mix in a couple squirts of the detergent. Run the system depressurized with the watermaker drawing water from the bucket and discharging overboard. When about half the water is gone from the bucket stop the unit and let the membrane soak for a few minutes. Restart and pump the remaining solution overboard. Repeat until the discharge appears clean.

After most of the oil is cleaned out you can put the brine discharge into the bucket and run the system with the soapy water circulating as you would for the other cleaning chemicals. Rinse the system with a bucket of fresh water or the fresh water flush cycle, then flush for twenty minutes using sea water. Pressurize and test.

5/12/04

PF-2 CHARCOAL FILTERS

The function of the charcoal filter element, p/n FT -FTC-CC, is to remove any chlorine in the fresh water flush water supply. It also removes any particulate matter. The charcoal filter we use removes 99.7% of the chlorine. Beware when buying other charcoal filters. If they don't specify the percentage of chlorine removed, don't use them. The cheap ones in most cases will only remove 60 or 70%. Also, there are aftermarket filters which are very close to, but not exactly, the same dimensions that will not seal properly in the housing. The membrane can only handle small amounts of chlorine for short periods without damage. The chlorine will damage the bonding agent in the membrane in a very short time. So if you skimp on the charcoal filter you will destroy a $595.00+ membrane on the first flush. The other factor is the flow rate that the filter can handle. Because the chlorine is deactivated by a chemical reaction with the charcoal, it must remain in contact with the charcoal for sufficient period of time for the reaction to be complete. The filter we use can handle 1.5 gallons (6 litres) per minute flow, and are good for 5000 gallons (12,000 litres) at 1.5 GPM, or six months, whichever comes first. Regardless of the flow the charcoal loses its effectiveness after six months.

SPECTRA
WATERMAKERS

Z-BRANE OPERATION MANUAL

The **Z-brane** is a revolutionary product which incorporates the Z-Guard High Voltage Capacitive technology into the membrane pressure vessel. Always active, the Z-Brane creates an environment that is unfriendly to bio-film and bacteria. The Z technology also assists in the prevention of scale formation on the membrane surfaces. The Z-Brane allows the system to be shut down or decommissioned for extended periods of time without chemicals or preservatives. The Z-Brane will not prevent freezing so that in cold climates Propylene Glycol is still required.

ANODE INSTALLATION

Spectra Watermakers ship the High Pressure Module with the White Z-brane Anode(s) removed from their socket(s) to prevent shipping damage. Before the High Pressure Module is mounted the anodes should be installed.

The socket(s) have been plugged with plastic plugs to keep the membranes clean and moist during shipping and storage. Remove the "C-clips" that secure the plugs, and remove the plugs. Insert an anode into each socket. It doesn't matter which anode goes in which socket. Insert the anode until the groove is flush with the membrane end plug, so the C-clip will slip into the groove. Install the C-clip screw to secure the clip.

WIRING

The Z-Brane system is integral with the watermaker unit and only requires continuous 12Vor 24V DC power to be operative.

Note: There is no reason to open the transformer enclosure. Do not service this unit without disconnecting the power source! There may be high voltage present.

It is recommended that the Z -Brane be connected to a discreet continuous power source. The power must be on during the time that the system is operation and during the time the Z -Brane is used for membrane storage. If the power is obtained from the MPC then the MPC must be powered up at all times during storage. This may not be desirable.

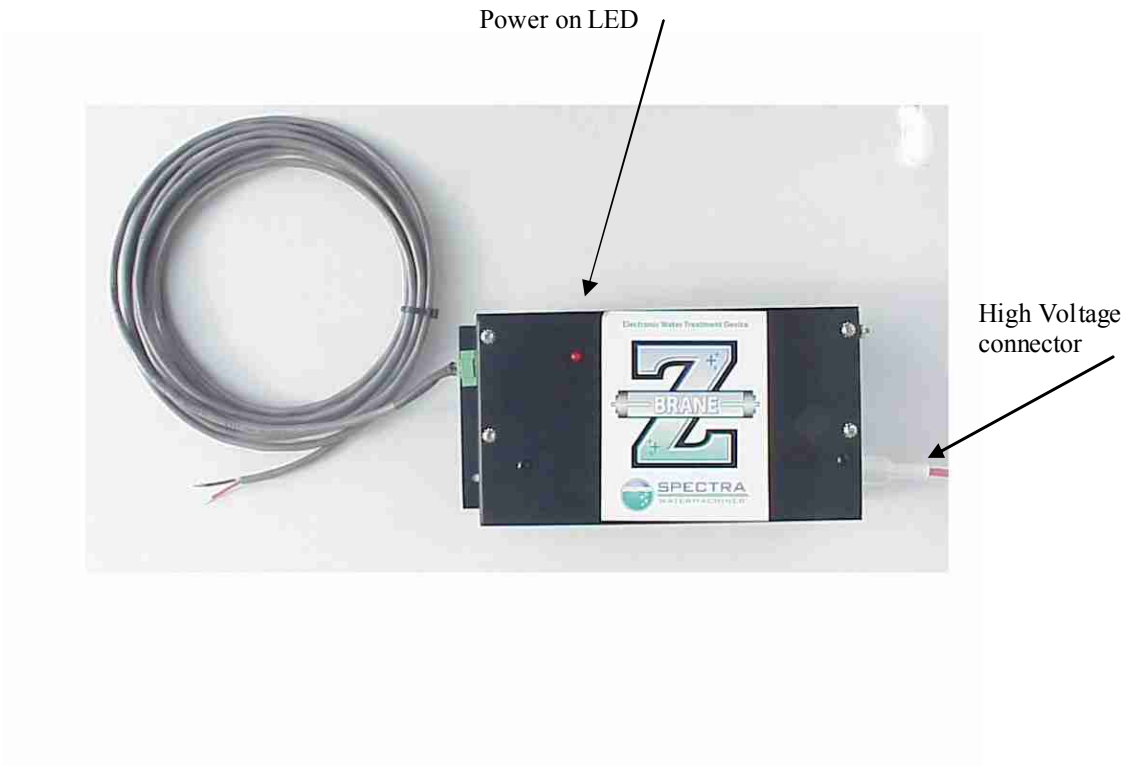
Fuse the power at the source with a 5 amp fuse or circuit breaker.
Red is Positive (+) , Black is Ground (-)

Z-Brane Power Harness

Operation

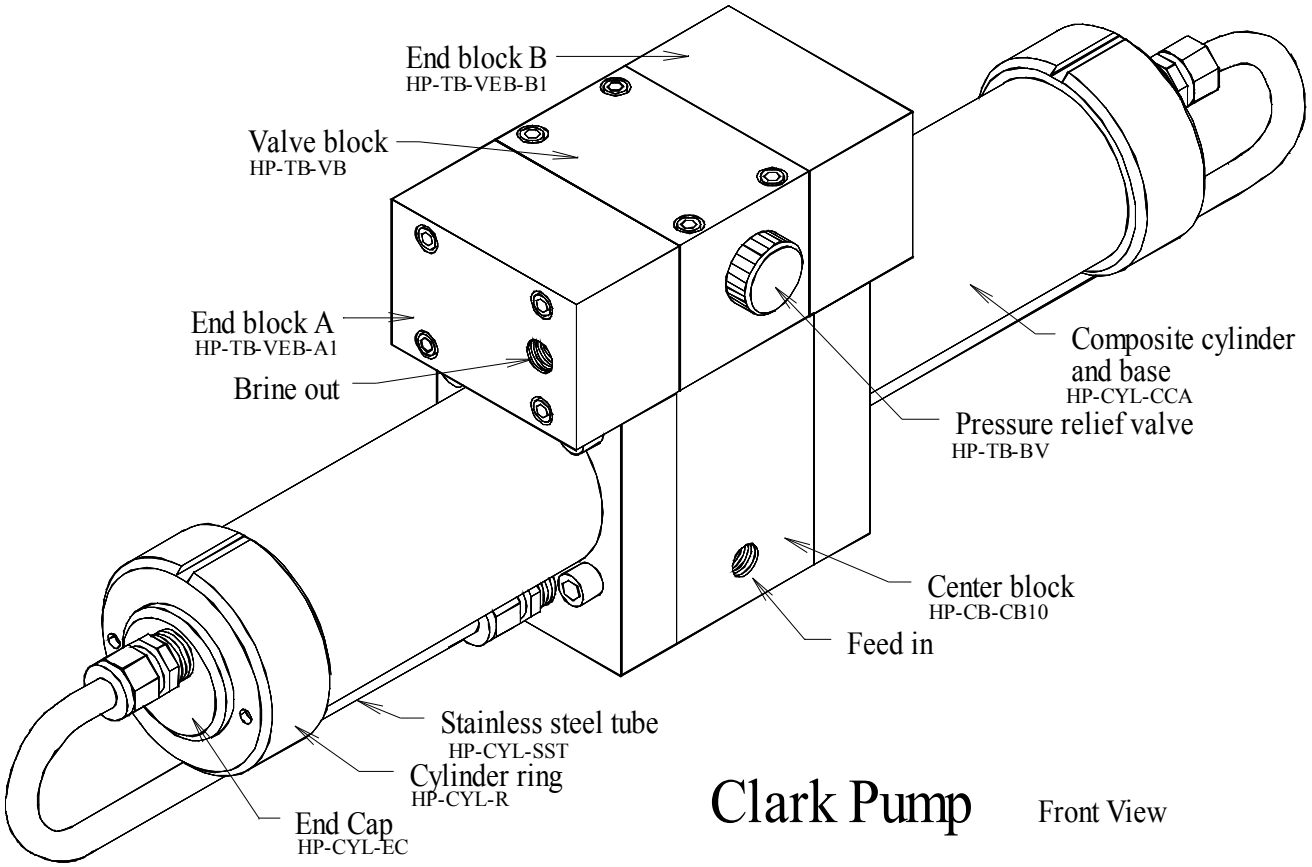
During normal operation the Red LED should be on . Power needs to be supplied to the Z - Brane unit at all times that you wish to have the biofouling and scale protection. We recommend that your watermaker be flushed after each use not only to protect the membrane but to prevent corrosion in the feed water system. To achieve full effectiveness thoroughly fresh water flush the watermaker several times before leaving the vessel.

The Z-Brane may be de -powered if the system is stored with chemicals or winterized with Glycol.

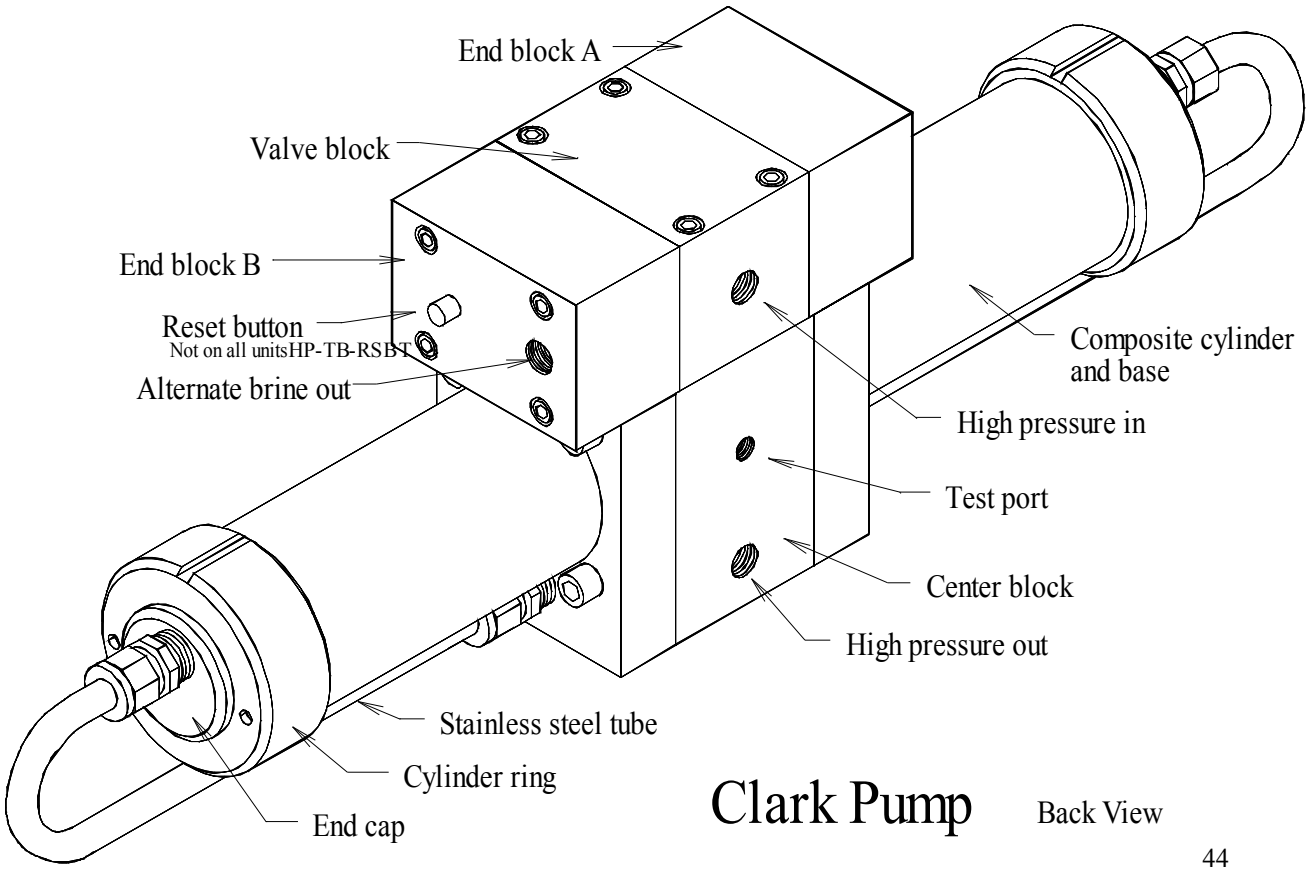


DO NOT DISCONNECT
OR SPLICE ANY OF THE
HIGH VOLTAGE WIRING!

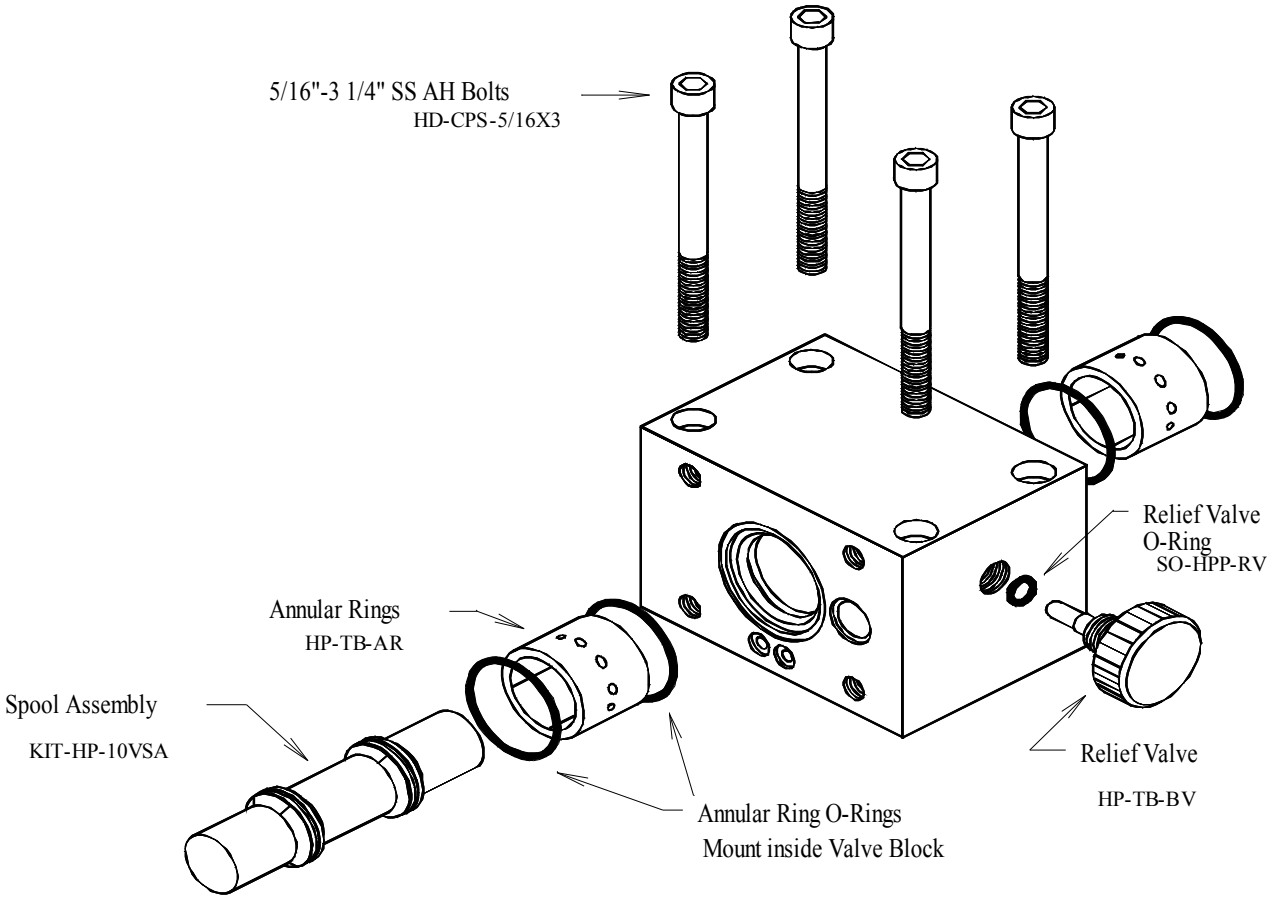
Contact the factory if
modifications are required.



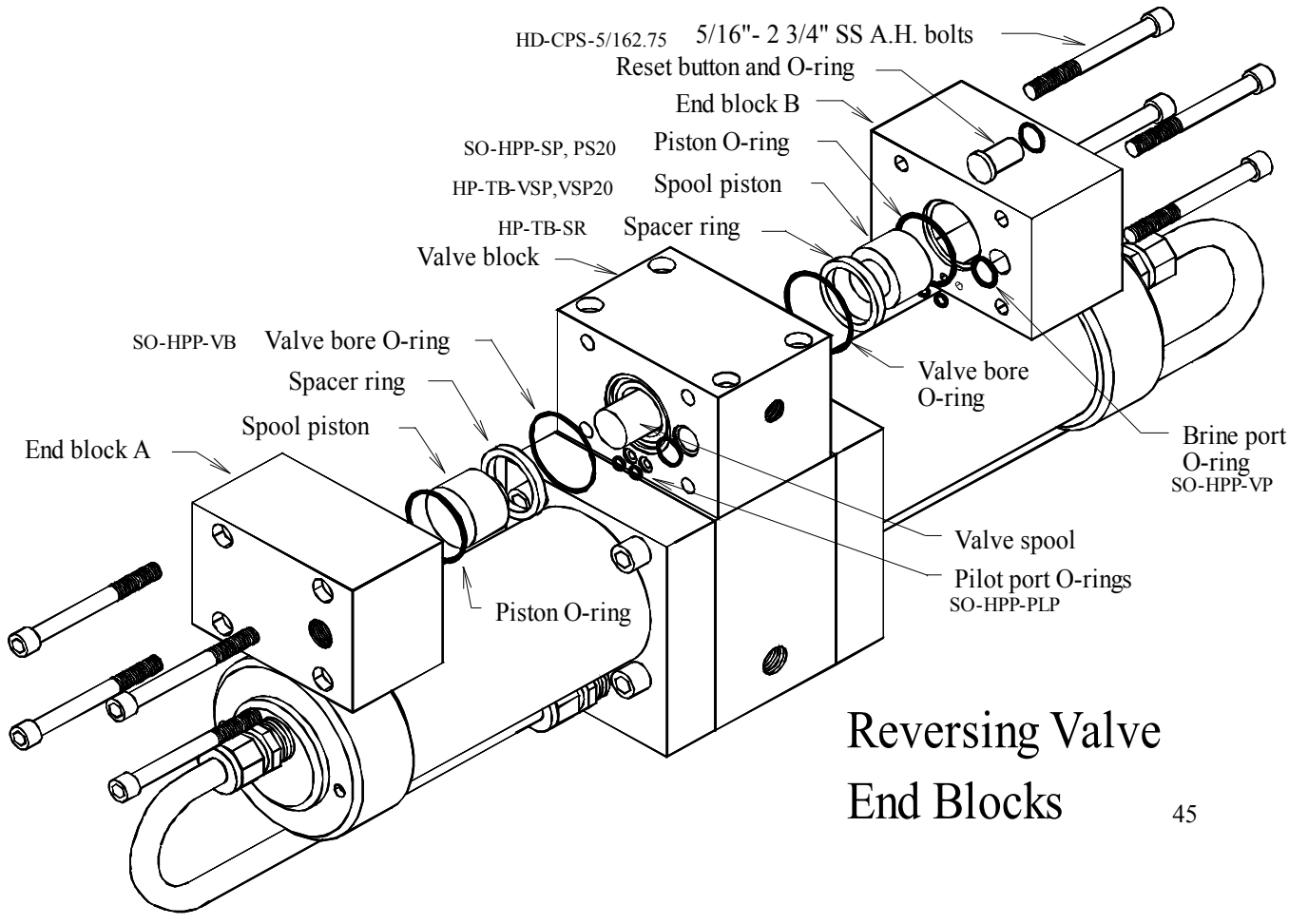
Clark Pump Front View



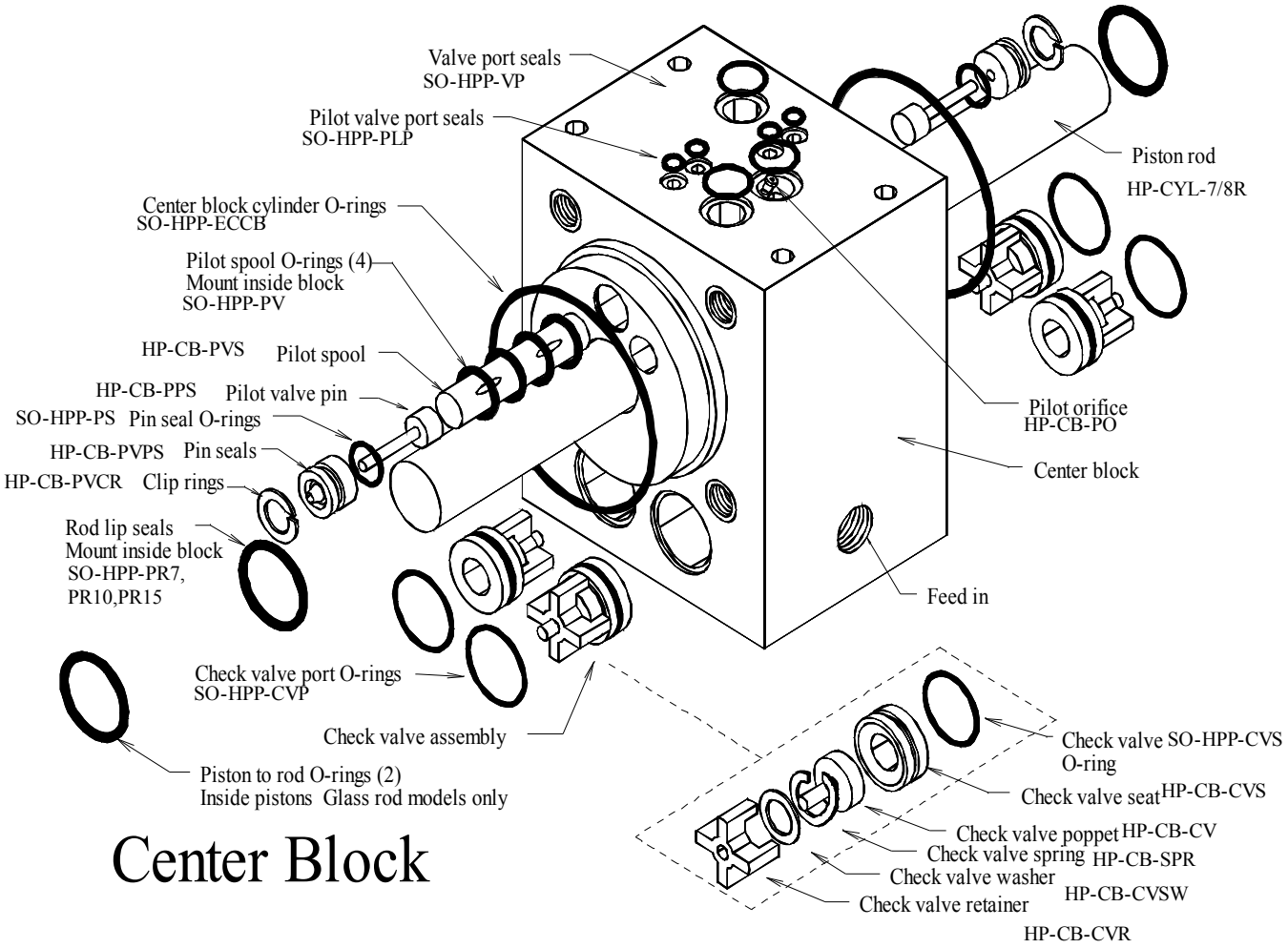
Clark Pump Back View



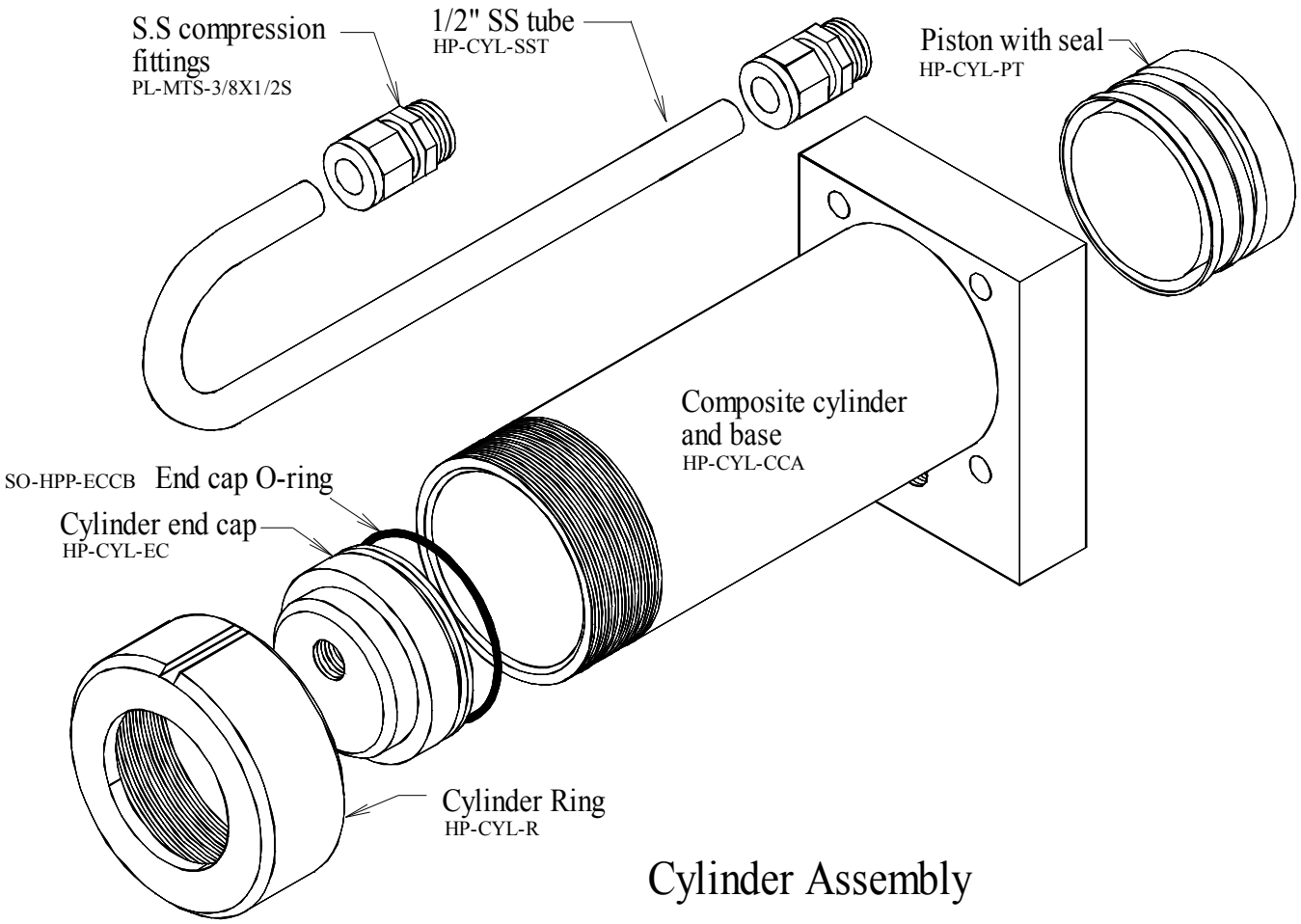
Valve Block



Reversing Valve
End Blocks



Center Block



Cylinder Assembly

10% CLARK PUMP PARTS LIST

PART	DESCRIPTION	USAGE
HP-CB-CB10	CENTER BLOCK	1
HP-CB-INS	CENTER BLOCK INSERT	4
HP-TB-VB	VALVE BODY	1
HP-TB-BV	BLEED VALVE	1
HP-TB-VEB-A1	VALVE END BLOCK A 1 -1/4"	1
HP-TB-VEB-A2	VALVE END BLOCK B 1 -1/4"	1
HP-CB-PVPS	PILOT VALVE PIN SEAL	2
HP-CB-PPS	PILOT VALVE PIN	2
HP-CB-PVCR	PILOT VALVE CLIP RING	2
HP-CB-SPRP	CHECK VALVE SPRING PLASTIC (DELRIN)	4
HP-CB-CVSW	CHECK VALVE SPRING WASHER	4
HP-CB-PVS	PILOT VALVE SPOOL	1
HP-CB-CVS	CHECK VALVE SEAT	4
HP-CB-CVR	CHECK VALVE RETAINER	4
HP-CB-CV	CHECK VALVE	4
HP-TB-AR	ANNULAR RING	2
HP-TB-10VSA	10% REV. VALVE SPOOLASSEMBLY	1
HP-TB-VSS	REV. VALVE SPOOL SEAL	2
HP-TB-VSP	REV. VALVE SPOOL PISTON	2
HP-CYL-EC	CYLINDER END CAP	2
HP-TB-EBP	END BLOCK PLUG	2
HP-CYL-7/8R	PISTON ROD	1
HP-CYL-PT	PISTON	2
HP-TB-SR	SPACER RING	2
HD-CPS-3/824175	3/8-24X1 3/4 CAP SCREW	8
HD-CPS-5/16X3	5/16-18X3 1/4 CAP SCREW	4
HD-CPS-5/162.75	5/16 X 2 3/4 CAP SCREW	8
HD-WSH-3/8X5/8S	3/8 X 5/8 O.D. SS FLAT WASHER	8
HP-CYL-SST	STAINLESS TUBE	2
PL-MTS-3/8X1/2S	3/8"NPT X 1/2"TUBE FITT ST SS.	4
HP-CYL-CC	COMPOSIT CYLINDER	2
HP-CYL-CCB	COMPOSIT CYLINDER BASE	2
HP-CYL-R	CYLINDER END RING	2
PILOT ORIFICE	PILOT ORIFICE	1
PL-HP-3/8N	GLASS FILLED BLACK NYLON PLUG 3/8'NPT	1
PL-HP-1/4BR	1/4 COUNTER SUNK HEX PLG.	1
PL-MTE-3/4SX1/2	3/4"MPT(ST) X 1/2" TUBE SS FITT. ELL.	2
SO-HPP-PLP	PILOT PORTS	8
SO-HPP-PS	PIN SEALS	2
SO-HPP-VP	VALVE PORTS	6
SO-HPP-CVS	CHK. VALVE SEATS	4
SO-HPP-CVP	CHK. VALVE PORTS	4
SO-HPP-VB	VALVE BORE	2
SO-HPP-ECCB	END CAP & CENTER BLOCK	4
SO-HPP-AR	ANNULAR RING	4
SO-HPP-PV	PILOT VALVE	4
SO-HPP-RV	RELIEVE VALVE	1
SO-HPP-CT	CONNECTOR O-RING	2
SO-HPP-SP1	SPOOL PISTON O-RING 1"	2
SO-HPP-Q	QUAD SEAL	2
SO-HPP-PR10	10%, 20% PISTON ROD	2